

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q92973

Mitsuru YAMAMOTO, et al.

Appln. No.: 10/566,580

Group Art Unit: 3746

Confirmation No.: 5128

Examiner: Not Yet Assigned

Filed: January 31, 2006

For: DIAPHRAGM PUMP AND COOLING SYSTEM WITH THE DIAPHRAGM PUMP

**REQUEST FOR CORRECTED OFFICIAL FILING RECEIPT**

**ATTN:** Office of Initial Patent Examination

Filing Receipt Correction

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

We enclose a copy of the Official Filing Receipt for the above-identified application and request the following correction:

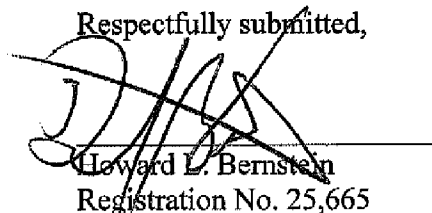
Please correct the **TOT CLMS** section of the Official Filing Receipt as shown below.

**TOT CLMS**

40 13

Verification for the requested correction is indicated on the Preliminary Amendment, filed January 31, 2006, a copy of which is submitted herewith.

Respectfully submitted,



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WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Date: April 13, 2007



## UNITED STATES PATENT AND TRADEMARK OFFICE

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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/566,580	01/31/2006	3746	1260	Q92973	8	1013	1

23373

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 WASHINGTON, DC 20037

**DOCKETED**

DEC 05 2006

CONFIRMATION NO. 5128

FILING RECEIPT



\*OC000000021389365\*

Date Mailed: 11/30/2006

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

**Applicant(s)**

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**Power of Attorney:** The patent practitioners associated with Customer Number 23373.

**Domestic Priority data as claimed by applicant**

This application is a 371 of PCT/JP04/10339 07/21/2004

**Foreign Applications**

JAPAN 2003-285915 08/04/2003

**If Required, Foreign Filing License Granted:** 11/28/2006

**The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is** **US10/566,580**

**Projected Publication Date:** 03/08/2007

**Non-Publication Request:** No

Early Publication Request: No

**Title**

Diaphragm pump and cooling system with the diaphragm pump

**Preliminary Class**

417

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**PATENT APPLICATION**

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For: DIAPHRAGM PUMP AND COOLING SYSTEM WITH THE DIAPHRAGM PUMP

**PRELIMINARY AMENDMENT**

**MAIL STOP AMENDMENT**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

Prior to examination, please amend the above-identified application as follows on the accompanying pages.

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Preliminary Amendment  
National Stage Entry of PCT/JP2004/010339

**AMENDMENTS TO THE SPECIFICATION**

**Amend the specification by adding before the first line the sentence:**

This application claims priority from PCT Application No. PCT/JP2004/010339 filed July 21, 2004 and from Japanese Application No. 2003-285915 filed August 4, 2003, which applications are incorporated herein by reference.

**AMENDMENTS TO THE CLAIMS**

**This listing of claims, which is based on Article 34 amendments, will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (Original) A diaphragm pump comprising:
  - a pressure chamber formed into a flat shape and is filled up with liquid;
  - a suction side flow passage and a discharge side flow passage disposed at both ends of the pressure chamber so that axes thereof are aligned with each other and are connected with the pressure chamber;
  - at least one groove formed in a peripheral wall of the pressure chamber and for accelerating a flow of the liquid downstream in a flow direction; and
  - at least one diaphragm disposed on at least one of an upper surface and a lower surface of the pressure chamber and for oscillation to make a volume of the pressure chamber variable.
  
2. (Original) The diaphragm pump according to Claim 1, wherein the groove has a part with an opening in the upper surface facing the pressure chamber, into which the liquid flows, and a side part with an opening opened to a peripheral wall surface of the pressure chamber, from which the liquid is discharged downstream in the flow direction.

Preliminary Amendment

National Stage Entry of PCT/JP2004/010339

3. (Original) The diaphragm pump according to Claim 1 or 2, wherein the groove is extended in a radial direction while a point in the vicinity of an entrance of the discharge side flow passage is set as the center.

4. (Currently Amended) The diaphragm pump according to any one of ~~Claims 1 to 3~~ Claims 1 or 2, wherein the axes are positioned at the center of a cross-sectional shape of the pressure chamber in a surface orthogonal to the axes.

5. (Currently Amended) The diaphragm pump according to any one of ~~Claims 1 through 4~~ Claims 1 or 2, wherein each cross-sectional shape of the pressure chamber, the suction side flow passage, and the discharge side flow passage in a surface orthogonal to the axes are formed in an approximate rectangle.

6. (Original) The diaphragm pump according to Claim 5, wherein a lower surface of the pressure chamber and the lower surfaces of the suction side flow passage and the discharge side flow passage are formed on the same surface.

7. (Currently Amended) The diaphragm pump according to any one of ~~Claims 1 through 6~~ Claims 1, 2 or 6, wherein a length of the pressure chamber viewed from an upper



surface in a direction orthogonal to the axes is continuously shortened toward the suction side flow passage or the discharge side flow passage.

8. (Currently Amended) The diaphragm pump according to any one of ~~Claims 1 through 7~~ Claims 1, 2 or 6, wherein a height of the pressure chamber is continuously lowered toward the suction side flow passage or the discharge side flow passage.

9. (Currently Amended) The diaphragm pump according to any one of ~~Claims 1 through 8~~ Claims 1, 2 or 6, further comprising:

check valves, respectively disposed on the suction side flow passage and the discharge side flow passage, at least one of the check valves being tilted relative to a direction of the axes.

10. (Currently Amended) The diaphragm pump according to any one of ~~Claims 1 through 9~~ Claims 1, 2 or 6, further comprising:

at least one intake opened to an upper surface of the suction side flow passage and to introduce bubbles mixed in the liquid; and

a sealed space connected with the intake and to collect the introduced bubbles.

11. (Original) The diaphragm pump according to Claim 10, wherein the intake is positioned in the suction side flow passage upstream relative to the check valve.

12. (Currently Amended) The diaphragm pump according to any one of ~~Claims 1 through 11~~ Claims 1, 2, 6 or 11, wherein the diaphragm is a piezoelectric oscillator driven by a piezoelectric element.


13. (Currently Amended) A cooling system comprising:  
the diaphragm pump according to any one of ~~Claims 1 through 12~~ Claims 1, 2, 6 or 11; and  
a closed-structure flow passage for circulating liquid discharged from the discharge side flow passage in the diaphragm pump and for returning the liquid to the suction side flow passage.

Preliminary Amendment  
National Stage Entry of PCT/JP2004/010339

**REMARKS**

Entry and consideration of this Amendment are respectfully requested.

Respectfully submitted,

  
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